Fermilab
FY2002 Self-assessment
Process Assessment Report
For
Division/Section: Particle Physics Division

Date: September 23, 2002

Division/Section performing assessment

Particle Physics Division (PPD)

Name of organization that owns assessed process

PPD Mechanical Department - CDF Operations Group

Organization Strategy

The CDF Operations Group provides routine maintenance and emergency response to the following main systems of the CDF experiment:

- Cryogenics.
- Gas.
- Cooling (water and glycol).
- HVAC.
- Racks.

Names of Personnel on Assessment team

Stefano Moccia, PPD/MD/CDF Project Engineer

Name of process assessed

Mechanical Department' s CDF Operations Group Log.

Brief description of process to be assessed

The MD CDF Operations Group Log has the two following main goals:

- Analyze system performance and make changes/enhancements required to minimize future downtime for the CDF experiment.
- Keep track of all the problems and relative solutions in order to respond swiftly to problems of the same nature so that the experiment downtime is minimum.

The CDF Operations Group Log is an electronic logbook where all the personnel on shift record all the events related to CDF operations that occur. The entries contain all the necessary information to identify the problem, if any, the action taken to solve it, completion of routine checklists and beginning and finish of the shifts.

1. Are metrics associated with this process? If so, what are they?

The metric used in assessing the quality of our Operations Log is the percentage of log entries which were completely acceptable to fulfill the two main goals presented above. We used the following table to arrive at our rating:

0 – 75% = Unsatisfactory

76% - 90% = Marginal

91% - 95% = Good

96% - 98% = Excellent

99% - 100% = Outstanding

2. What are the names of the procedures associated with this process?

There is no procedure. We follow best management practices in logkeeping.

3. Are these procedures being followed? Are they current?

N/A

4. Describe the methodology used to assess this process.

We examined all logbook entries for the past six months to prepare the data for the study. For self-assessment purposes, we rated each logbook entry as acceptable or unacceptable based on whether the entry provided sufficient information for the reader to quickly perform the classification analysis. Any insufficiency in the entry resulted in an unacceptable rating. We then tabulated the percentage of acceptable ratings and assigned our Performance grade according to the table described in (1).

As an aid to management, we performed an analysis of the value to the experiment of maintaining extended shift coverage. We prepared a table which breaks down log entries into a set of useful classification groups and a summary table which provides us with the analysis of the using extended shift coverage versus “downtime event driven call-in support” model.

5. Results of the assessment:

The percentage of acceptable entries was 98% so the grade result is Excellent.

We were pleased with the quality of the entries which provide the right amount of information so the reader can understand immediately what the nature of the event recorded is without talking directly with the operator.

We note that 60% of the entries are about “pumping the Watt Can” which is a critical component of our superconducting solenoid cryogenic system. The Watt Can has been upgraded so that shutting down the solenoid to pump it down is no longer necessary. This operation is still considered critical and a vulnerable point of the cryogenic system, so experts are still doing this operation.

Identified opportunities for improvement

With the continuing trend toward better operational stability and reliability, we should examine further the possibility of reducing extended shift coverage.

In order to reduce operator’s duties, the operation of pumping down the “Watt can” can be automated in the future.

Schedule for implementation of improvements

We will evaluate the extended shift coverage and the technical feasibility of automating “Watt Can” pumpdowns by January, 2003.

Status of improvements from previous assessment

This is the first time that an assessment of this kind has been done for CDF.

Attachments (supporting data, worksheets, reports, etc.

A spreadsheet is attached reporting a brief description, since April 1st 2002, of all the major events (completion of routine checklists are not reported) recorded in the Log. The entries are also categorized according to parameters described in the spreadsheet.

List of major operations events since April 1st 2002.

Completion of routine checklists are not reported.
The entries are categorized according to parameters described in the spreadsheet header

				Choose 1									
DATE		**EVENT description (brief)**	Initiated by an alarm? (Y = 1, N = 0)	Initiated by Ops tech? (Y =1 or N = 0)	Initiated by Experiment physicists?	Simple Magnet operation?	Did event trigger an alarm? (Y=1, N=0)	Was some Action taken? (Y=1 or N=0)	Call made to an expert? (Y=1, N=0)	Would a physicist probably call an expert? (Y or N)	an expert via the phone? (Y or N)	Would ops tech or expert need to come in? (Y or N)	Would it have been bad for the experiment? (Y or N)
Totals		**Totals**	**74**	**247**	**8**	**201**	**64**	**326**	**11**	**115**	**47**	**279**	**271**
		Total events =	**329**										
4/1/02		reset a trouble alarm for CLC east	1	0	0	0	0	1	0	1	0	1	0
4/1/02		verified wet engine vacuum reading discrepency	0	1	0	0	0	1	0	0	0	0	0
4/3/02		closed the valve on the golden gas bottle checking for leaks, could not fine any	0	1	0	0	0	1	0	0	0	0	0
4/4/02		investigated TE 81 thermal element going in and out of alarm, silenced	1	0	0	0	0	1	0	1	1	0	0
4/6/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/6/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/7/02		Several alarms on the solenoid voltage, cryo/water investigated	1	0	0	0	0	1	0	1	0	1	0
4/7/02		CLC East flammable gas trouble alarm.	1	0	0	0	0	1	0	1	0	1	1
4/7/02		IMU SW trouble alarm	1	0	0	0	0	1	0	1	0	1	1
4/7/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/8/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/8/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/9/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/9/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1

4/10/02		CLC West flammable gas trouble alarm.	1	0	0	0	0	1	0	1	0	1	1
4/11/02		Changed HVAC state for search and secure team	0	1	0	0	0	1	0	1	1	0	0
4/12/02		Power the solenoid	0	1	0	0	0	1	0	1	0	1	1
4/13/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/14/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/14/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/14/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/16/02		Changed HVAC state for access	0	1	0	0	0	1	0	1	1	0	0
4/16/02		Recover SUVA for COT repairs	0	1	0	0	0	1	0	1	0	1	1
4/18/02		Put SUVA in operation; perform procedure 13 for COT	0	1	0	0	0	1	1	1	0	1	1
4/19/02		Found valve in wrong position	0	1	0	0	1	1	1	1	0	1	1
4/19/02		LCW alarm	1	0	0	0	1	0	0	0	1	0	0
4/19/02		Set COT to fast flush mode	0	1	0	0	0	1	0	1	0	1	1
4/20/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/20/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/21/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/21/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/22/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/22/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/22/02		set COT to normal flow rates	0	1	0	0	0	1	0	0	0	1	1
4/23/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/24/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/24/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/24/02		reboot and start CDFS1	0	1	0	0	0	1	0	1	1	0	0
4/25/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/25/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/26/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/26/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/26/02		COT cold trap failure	1	0	0	0	1	1	1	1	0	1	0
4/27/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/27/02		gas shed alarm - dP ethane heater box	1	0	0	0	1	1	0	1	1	0	0
4/27/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/28/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/28/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/28/02		CLC West flammable gas trouble alarm.	1	0	0	0	0	1	0	1	1	0	0
4/29/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
4/29/02		PVLF controls problem discovered	0	1	0	0	0	0	1	0	0	1	0
4/30/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/1/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1

5/1/02		dry engine valves needed adjusting	0	1	0	0	0	1	0	0	0	1	1
5/1/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/2/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/3/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/3/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/4/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/4/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/4/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/5/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/5/02		COT alarm - SUVA low	1	0	0	0	1	1	0	1	1	0	0
5/5/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/5/02		Changed HVAC state for access	0	1	0	0	0	1	0	1	1	0	0
5/5/02		Change power supply, move walls (coll. Hall access)	0	0	1	0	0	1	1	1	0	1	1
5/5/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/6/02		COT alarm - SUVA low	1	0	0	0	1	1	0	1	1	0	0
5/6/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/7/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/7/02		fix CDFS1 hang up	0	1	0	0	0	1	0	1	1	0	0
5/7/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/8/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/8/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/9/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/9/02		gas shed pneumatics alarm	1	0	0	0	1	1	0	1	0	1	1
5/9/02		lcw di bottles alarm	1	0	0	1	1	1	1	1	1	0	0
5/10/02		svnet power supply	0	0	1	1	1	1	0	1	1	0	0
5/10/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/11/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/11/01		gas shed alarm - dP ethane heater box	1	0	0	0	1	1	0	1	1	0	0
5/11/02		gas shed alarm - dP ethane heater box	1	0	0	0	1	1	0	1	1	0	0
5/11/02		gas shed alarm - dP ethane heater box	1	0	0	0	1	1	0	1	1	0	0
5/11/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/12/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/12/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/13/02		alarm gas ces supply low flow	1	0	0	0	1	1	0	1	0	1	1
5/13/02		alarm cot suva storage low level	1	0	0	0	1	1	0	1	0	1	1
5/13/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/13/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/14/02		alarm high cot alcohol temperature	1	0	0	0	1	1	0	1	0	1	1
5/14/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1

5/14/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/15/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/16/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/16/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/16/02		alarm suva low level	1	0	0	0	1	1	0	1	1	0	0
5/17/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/18/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/19/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/19/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/20/02		alarm suva low level	1	0	0	0	1	1	0	1	1	0	0
5/20/02		reboot and start CDFS1	0	1	0	0	0	1	0	1	1	0	0
5/21/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/23/02		flammables alarm clc west trouble	1	0	0	0	0	1	0	1	0	1	1
5/24/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/24/02		historical data stopped collecting data	0	1	0	0	0	1	1	0	0	1	1
5/24/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/25/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/26/02		sitewide power outage	1	0	0	0	1	1	0	1	0	1	1
5/28/02		cot cold trap alarm	1	0	0	0	1	1	0	1	0	1	1
5/28/02		cot cold trap alarm	1	0	0	0	1	1	0	1	0	1	1
5/28/02		cot cold trap alarm	1	0	0	0	1	1	0	1	0	1	1
5/28/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/29/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/30/02		clc west pressure increased	0	0	1	0	0	1	0	1	0	1	1
5/31/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
5/31/02		solenoid #2 ifix was shutdown	0	0	1	1	0	1	0	1	0	1	1
5/31/02		alarm suva low level	1	0	0	0	1	1	0	1	1	0	0
6/1/02		alarm suva low level	1	0	0	0	1	1	0	1	1	0	0
6/1/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/1/02		hvac bf-1 would not start	0	1	0	0	0	1	0	1	0	1	1
6/2/02		alarm suva low level	1	0	0	0	1	1	0	1	1	0	0
6/3/02		alarm isl	1	0	0	0	1	1	1	1	0	1	1
6/4/02		gas shed alarm - dP ethane heater box	1	0	0	0	1	1	0	1	1	0	0
6/4/02		gas shed alarm - dP ethane heater box	1	0	0	0	1	1	0	1	1	0	0
6/4/02		air comp. had a major leak	0	1	0	0	0	1	0	1	0	1	1
6/8/02		alarm svxswb	1	0	0	0	1	1	0	0	1	0	0
6/11/02		svx dewpoint	1	0	0	0	1	1	0	0	1	0	0
6/11/02		isl flows	1	0	0	0	1	1	0	0	1	0	0
6/14/02		lcw system	1	0	0	0	1	1	0	1	1	0	0
6/14/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/15/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/15/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/15/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1

6/16/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/16/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/16/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/17/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/17/02		solenoid powered after a trip	1	0	0	0	1	1	0	1	0	1	1
6/17/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/17/02		lost CDFS3 heartbeat	0	1	0	0	0	1	0	1	1	0	0
6/18/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/19/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/19/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/20/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/20/02		Chiller 4 trip	0	1	0	0	0	1	0	1	0	1	1
6/20/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/21/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/21/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/22/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/22/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/22/02		CDFS4 workspace crashed	0	1	0	0	0	1	0	1	1	0	0
6/23/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/23/02		Chiller 2 compressor 4 trip	0	1	0	0	0	1	0	0	0	0	0
6/24/02		Solenoid APACS error	1	0	0	0	1	1	0	1	0	1	0
6/24/02		Solenoid powerup halted due to AstroDaq	0	1	0	0	1	1	0	1	0	1	1
6/24/02		CDFS3 locked up	0	1	0	0	0	1	0	1	1	0	0
6/25/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/25/02		Solenoid slow dump due to ground fault	1	0	0	0	1	1	1	1	0	1	1
6/25/02		Collision hall access for solenoid	0	0	1	0	0	1	1	0	0	1	1
6/27/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/27/02		CLC West flammable gas trouble alarm.	1	0	0	0	0	1	0	1	0	1	1
6/28/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/28/02		hvac bf-1 would not start	0	1	0	0	0	1	0	1	0	1	1
6/29/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/29/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
6/30/02		chiller #3 trip	0	1	0	0	0	1	0	1	0	1	1
6/30/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/1/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/2/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/2/02		high southwall mid temp.	1	0	0	0	1	1	0	1	1	0	0
7/2/02		chiller #2 trip	0	1	0	0	0	1	0	1	0	1	1
7/3/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/3/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/5/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/5/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/5/02		CLC West flammable gas trouble alarm.	1	0	0	0	0	1	0	1	0	1	1

7/6/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/7/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/7/02		imu n.e flammable gas alarm	1	0	0	0	1	1	0	1	1	0	0
7/7/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/8/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/8/02		imu south east flammable gas alarm	1	0	0	0	1	1	0	1	1	0	0
7/8/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/9/02		water flooding assembly hall due to a heavy rain and clogged drain	0	1	0	0	0	1	0	0	0	1	1
7/9/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/9/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/10/02		D.I bottle alarm sounded	1	0	0	0	1	1	0	1	0	1	1
7/10/02		water softener relief valve leaking	0	1	0	0	0	1	0	1	0	1	0
7/11/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/11/02		LN2 dewar valve leaking	0	1	0	0	0	1	0	1	0	1	1
7/12/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/13/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/15/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/15/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/16/02		PF 1 tranducer door hanging loose	0	1	0	0	0	1	0	1	1	0	0
7/16/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/17/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/17/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/18/02		chiller #4 tripped out	0	1	0	0	0	1	0	1	0	1	1
7/18/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/18/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/19/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/19/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/20/02		imu north west flammable gas alarm	1	0	0	0	1	1	0	0	0	1	1
7/21/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/21/02		epnw rack fan failure	1	0	0	0	1	1	0	1	0	1	1
7/22/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/23/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/23/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/24/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/25/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/25/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/25/02		ces chamber went into high 02 alarm	1	0	0	0	1	1	0	1	0	1	1
7/27/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/27/02		cmex north east top gas head troubble	1	0	0	0	1	1	0	1	0	1	1
7/27/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1

7/28/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/29/02		gas shed alarm - dP ethane heater box	1	0	0	0	1	1	0	1	1	0	0
7/29/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/30/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/30/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
7/31/02		Solenoid freewheel on water flow	1	0	0	0	1	1	0	1	0	1	1
7/31/02		LN2 fill problem	0	1	0	0	0	1	0	0	0	1	1
8/1/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/1/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/2/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/3/02		Chiller 4 trip	0	1	0	0	0	1	0	1	0	1	1
8/3/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/3/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/4/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/4/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/5/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/5/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/6/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/7/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/7/02		solenoid test	0	0	1	0	0	1	0	1	0	1	1
8/8/02		Chiller 4 trip	0	1	0	0	0	1	0	1	0	1	1
8/8/02		2RR30C alarm	1	0	0	0	1	1	0	1	0	1	1
8/8/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/10/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/10/02		NOT flow alarm	1	0	0	0	1	1	0	1	0	1	1
8/10/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/11/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/11/02		CLC West flammable gas trouble alarm.	1	0	0	0	0	1	0	1	1	0	0
8/11/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/12/02		COT alcohol temp. high	1	0	0	0	1	1	0	1	0	1	1
8/13/02		O2 anaylizer CES high	1	0	0	0	1	1	0	1	0	1	1
8/13/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/14/02		Chiller 4 trip	0	1	0	0	0	1	0	1	0	1	1
8/14/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/15/02		cmex north west top gas head trouble	1	0	0	0	0	1	0	1	1	0	0
8/15/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/16/02		IMU gas head trouble	1	0	0	0	0	1	0	1	1	0	0
8/17/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/17/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/18/02		gas shed pneumatics	0	1	0	0	0	1	0	1	0	1	1
8/18/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/18/02		IMU gas head trouble	1	0	0	0	0	1	0	1	1	0	0
8/19/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/19/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1

8/21/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/22/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/22/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/24/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/24/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/25/02		DI bottle alarm	1	0	0	0	1	1	0	1	1	0	0
8/25/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/25/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/26/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/27/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/28/02		COT cold trap	0	1	0	0	0	1	0	1	0	1	1
8/29/02		Power the solenoid	0	1	0	0	0	1	0	1	0	1	1
8/29/02		CPW pump #2	0	1	0	0	0	1	0	1	0	1	1
8/30/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/30/02		filled CLC east & west	0	0	1	0	0	1	0	1	0	1	1
8/30/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/31/02		A/E tank #1 valve	1	0	0	0	1	1	0	1	0	1	1
8/31/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
8/31/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/1/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/3/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/3//02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/3/02		2RR22F power supply	0	1	0	0	1	1	0	1	0	1	1
9/4/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/5/02		IMU alcohol temp.	1	0	0	0	1	1	0	1	0	1	1
9/5/02		adsorber	0	1	0	0	0	1	0	1	0	1	1
9/5/02		adsorber	0	1	0	0	0	1	0	1	0	1	1
9/6/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/6/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/7/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/7/02		IMU gas flow	1	0	0	0	1	1	0	1	0	1	1
9/8/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/8/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/9/02		HUT 11 high vacuum	0	1	0	0	0	1	0	1	0	1	1
9/9/02		nwa argon ethane gas alarm	1	0	0	0	1	1	0	1	0	1	1
9/10/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/10/02		flammable gas alarms clc east the imu north east and south east.	1	0	0	0	1	1	0	1	0	1	1
9/10/02		gas alarm nex low flow	1	0	0	0	1	1	0	1	0	1	1
9/11/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/12/02		magnet tripped	0	0	1	0	0	1	0	1	0	1	1
9/12/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/12/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/12/02		Put hvac into low hvac for access	0	1	0	0	0	1	0	1	0	1	0
9/12/02		BF-1 problem on hvac system	1	0	0	0	1	1	0	1	0	1	1
9/13/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1

9/14/02		Put hvac into low hvac for access	0	1	0	0	0	1	0	1	0	1	0
9/14/02		Main LN2 fill valve stuck open.	0	1	0	0	0	1	0	1	0	1	1
9/15/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/15/02		gas alarm on no valve open to tank # 4	1	0	0	0	1	0	0	0	1	0	0
9/15/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/16/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/16/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/16/02		EF2 HVAC alarm	1	0	0	0	1	1	0	1	1	0	0
9/17/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/17/02		COT alarm - SUVA low	1	0	0	0	1	1	0	1	1	0	0
0/17/02		EF2 HVAC alarm	1	0	0	0	1	1	0	1	1	0	0
9/18/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/18/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/19/02		COT alarm - SUVA low	1	0	0	0	1	1	0	1	1	0	0
9/20/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/20/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/21/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/21/02		DI bottle would have alarmed	0	1	0	0	0	1	0	1	1	0	0
9/21/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/22/02		gas alarm storage tanks wouldn't switch	1	0	0	0	1	1	1	1	0	1	1
9/23/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1
9/23/02		pumped the watt can	0	1	0	1	0	1	0	0	0	1	1

Summary Table of log entries.

Month	Total Events	Initiated by Ops tech? (Y =1 or N = 0)	Initiated by Experiment physicists?		Simple Magnet operation?		Did event trigger an alarm? (Y=1, N=0)		Was some Action taken? (Y=1 or N=0)	Call made to an expert? (Y=1, N=0)		Would a physicist probably call an expert? (Y or N)	Could a physicist handle it with an expert via the phone? (Y or N)	Would ops tech or expert need to come in? (Y or N)	Would it have been bad for the experiment? (Y or N)
April '02	**52**	**42**	**0**		**30**		**4**		**50**	**4**		**17**	**7**	**43**	**39**
May '02	**67**	**45**	**4**		**43**		**18**		**67**	**3**		**25**	**13**	**54**	**54**
June '02	**50**	**36**	**1**		**26**		**13**		**50**	**3**		**19**	**11**	**38**	**37**
July '02	**56**	**45**	**0**		**38**		**10**		**56**	**0**		**15**	**5**	**51**	**50**
August '02	**56**	**44**	**2**		**37**		**6**		**56**	**0**		**19**	**5**	**51**	**51**
September '02	**48**	**35**	**1**		**27**		**13**		**47**	**1**		**20**	**6**	**42**	**40**
Totals	**329**	**247**	**8**		**201**		**64**		**326**	**11**		**115**	**47**	**279**	**271**